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# A (3, 3)-homogeneous quantum logic with 18 atoms. i

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## Abstract

A quantum logic is called (m, n)-homogeneous if any its atom is contained exactly in m maximal (with respect to inclusion) orthogonal sets of atoms (we call them blocks), and every block contains exactly n elements. We enumerate atoms by natural numbers. For each block {i, j, k} we use the abbreviation i-j-k. Every such logic has the following 7 initial blocks B 1,. ., B 7: 1-2-3, 1-4-5, 1-6-7, 2-8-9, 2-10-11, 3-12-13, and 3-14-15. For an 18-atom logic the arrangements of the rest atoms 16, 17, and 18 is important. We consider the case when they form a loop of order 4 in one of layers composed of initial blocks, for example, l 4: 3-14-15, 15-16-17, 17-18-13, and 13-12-3. We prove that there exist (up to isomorphism) only 5 such logics, and describe pure states and automorphism groups for them. © 2012 Allerton Press, Inc.

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## Keywords

(3, 3)-homogeneous logic, Atom, Automorphism group, Block, Homogeneous quantumlogic, Pure state, Quantumlogic